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ORIGINAL ARTICLE

Stage fright: its experience as a problem and coping with it

Regina Studer · Patrick Gomez · Horst Hildebrandt · Marc Arial · Brigitta Danuser

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Abstract
Purpose and method This questionnaire survey of 190 university music students assessed negative feelings of music performance anxiety (MPA) before performing, the experience of stage fright as a problem, and how closely they are associated with each other. The study further investigated whether the experience of stage fright as a problem and negative feelings of MPA predict the coping behavior of the music students. Rarely addressed coping issues were assessed, i.e., self-perceived effectiveness of different coping strategies, knowledge of possible risks and acceptance of substance-based coping strategies, and need for more support.
Results The results show that one-third of the students experienced stage fright as a problem and that this was only moderately correlated with negative feelings of MPA. The experience of stage fright as a problem significantly predicted the frequency of use and the acceptance of medication as a coping strategy. Breathing exercises and self-control techniques were rated as effective as medication. Finally, students expressed a strong need to receive more support (65%) and more information (84%) concerning stage fright.
Conclusion Stage fright was experienced as a problem and perceived as having negative career consequences by a considerable percentage of the surveyed students. In addition to a desire for more help and support, the students expressed an openness and willingness to seriously discuss and address the topic of stage fright. This provides a necessary and promising basis for optimal career preparation and, hence, an opportunity to prevent occupational problems in professional musicians.

Keywords Performance anxiety · Music education · Coping · Musicians · Students

Institute for Work and Health affiliated to both the University of Lausanne and the University of Geneva.

R. Studer (✉) · P. Gomez (✉) · M. Arial · B. Danuser
Institut universitaire romand de Santé au Travail, Institute for Work and Health, Rue du Bugnon 21, 1011 Lausanne, Switzerland
e-mail: regina.studer@hospvd.ch

P. Gomez
e-mail: patrick.gomez@hospvd.ch

H. Hildebrandt
Swiss University Centre for Music Physiology, Zurich University of the Arts, Zurich, Switzerland

Introduction

Performance anxiety (also referred to as stage fright) is a group of disorders affecting individuals in a range of endeavors, such as public speaking, sport, and the performing arts in dancing, acting, and music making. Among performing artists, instrumentalists seem to be the most affected by anxiety, followed by singers, dancers, and actors (Marchant-Haycox and Wilson 1992). In professional orchestra musicians, stage fright has been shown to be the leading severe medical problem (Fishbein et al. 1988). Furthermore, performance anxiety has been reported to have a negative impact on musicians' well-being and health (Owen 2009; Steptoe 2001), to impair the quality of performance (Brotons 1994; Craske and Craig 1984; Fredrikson and Gunnarsson 1992; Wesner et al. 1990; Yoshie et al. 2009), to lead to avoidance or interruption of performance (Clark and Agras 1991; Kaspersen and Götestam 2002; Wesner et al. 1990), and thus, to affect the

musicians' personal life and/or professional career (Owen 2009; Steptoe 2001; van Kemenade et al. 1995; Wesner et al. 1990). Strong stage fright was associated with curtailment of careers before they begin (Rae and McCambridge 2004) and the interruption of established professional careers (Clark and Agras 1991). Importantly, stage fright is not limited to the period immediately before and during performance. It can occur days, weeks, or even months before the performance (van Kemenade et al. 1995). For all these reasons, performance anxiety represents a considerable occupational problem.

A standardized definition of music performance anxiety (MPA) is still lacking, and there is no consensus on the use of different terms for the phenomenon. The most frequently used terms, i.e., MPA and stage fright, have often been used interchangeably (Brotons 1994; Kokotsaki and Davidson 2003; Wilson 1997). However, some authors consider stage fright as an extreme form of MPA (Brodsky 1996; Kenny 2008; Möller 1999), whereas others consider MPA as an extreme form of stage fright (Fehm and Schmidt 2006). The most recent definition describes MPA as "the experience of marked and persistent anxious apprehension related to musical performance (…) which is manifested through combinations of affective, cognitive, somatic and behavioral symptoms" (Kenny 2008). When addressing negative affective symptoms, we will use the term *negative feelings of MPA* in the present article.

The purpose of this study was to further the knowledge on MPA and coping-related issues among university music students. Specifically, this study aimed to assess whether university music students experience stage fright as a problem and how closely the experience of stage fright as a problem is associated with negative feelings of MPA. Further, the study investigated whether the experience of stage fright as a problem and negative feelings of MPA predict the coping behavior of the music students. Four rarely addressed coping issues in the field of musical performance—the perceived effectiveness of different coping strategies, the acceptance of substance-based coping strategies, the knowledge on possible associated risks, and the need for more support to better cope with stage fright—were investigated.

University music students are for several reasons a particularly important group of musicians to investigate. First, they appear to suffer from particularly high levels of MPA (Kaspersen and Götestam 2002; Steptoe and Fidler 1987). Second, many of them plan to tackle a professional career as musicians. This implies in most cases recurrent public performances and consequently, the necessity to successfully cope with MPA. Third, they are at the beginning of their professional career. It is important to better understand MPA in this group to help them cope with it and to prevent an increase of substance-based coping strategies in their future professional life. The term "substance-based coping strategies" will be used throughout the article for the use of medication, alcohol, and illicit drugs. Fourth, music universities show a growing interest in MPA and in teaching students the necessary skills to better cope with MPA (Hildebrandt 2009; Hildebrandt and Nübling 2004; Liebelt and Schröder 1999; Rosenfeld 2009; Spahn et al. 2001).

Musical performance is not only associated with negative emotions, but also with positive arousal, pleasant anticipation, and satisfaction (Steptoe 2001). Furthermore, stress and tension in the context of musical performance do not only have negative effects. In fact, a moderate level of stress and tension seems to be considered by many musicians as a necessary and beneficial condition for an optimal performance (Wilson 1997). Thus, stage fright might not necessarily be experienced as a problem. Importantly, the assessment of the intensity and of the frequency of stage fright does not give any information on the extent to which it is actually experienced as a problem. Therefore, it is important to additionally assess the subjective experience of stage fright as a problem. To our knowledge, only the study by Fishbein et al. (1988) has assessed this issue. They reported that 16% of their sample of professional orchestra musicians considered stage fright as a severe problem. No study has yet addressed this issue in university music students. In our opinion, this information is essential, especially for a better understanding of musicians' health and coping behavior.

Effective coping is fundamental for artists suffering from performance anxiety. Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Traditionally, two styles of coping have been distinguished: emotion-focused coping, aiming at decreasing negative emotions, and problem-focused coping, aiming at changing the person-environment relationship. In the context of music performance, there are only limited possibilities to change the "problem", i.e., the public performance, and avoiding the performance is not an option if a musician wishes to succeed in his profession. We therefore concentrate exclusively on cognitive and behavioral coping strategies aiming at changing the subjective experience of the stressful situation.

Musicians have been shown to use different coping strategies reaching from meditation and breathing exercises to the consumption of alcohol, tranquilizers, and beta-blockers. Large differences in the use of alcohol, tranquilizers, and beta-blockers have been reported among different samples of musicians. Consumption of these substances varied from 0 to 27% of the surveyed musicians (Abilgaard and Mathe 2003; Fishbein et al. 1988; Krawehl and Altenmüller 2000; Steptoe 1989). Casual and serious amateurs (Clark and Agras 1991), music students (Fehm

and Schmidt 2006; Krawehl and Altenmüller 2000), and mixed samples of students and professionals (Abilgaard and Mathe 2003; Wesner et al. 1990) have been shown to use these substances less often than samples consisting of professional orchestra musicians (Fishbein et al. 1988; Steptoe 1989, 2001). These findings suggest that the use of substance-based coping strategies increases with increasing professionalism. Importantly, the use of substance-based coping strategies can have deleterious side effects on health or lead to addiction and can, therefore, become a serious occupational problem. The use of substance-based coping strategies should thus be closely surveyed. Furthermore, high compared to low performance-anxious musicians have been shown to make more coping efforts (Lehrer et al. 1990; Steptoe 2001). Steptoe et al. (1995) reported similar results for student actors. Therefore, we expected higher performance-anxious music students and music students considering stage fright as a problem (a) to use coping strategies more often and, as a consequence, (b) to accept substance-based coping strategies more easily than lower performance-anxious music students and music students not considering stage fright as a problem.

The acceptance of substance-based coping strategies is along with the perceived effectiveness of coping strategies and the need for more help and support to cope with MPA one of coping-related issues that have received only very limited attention in MPA research. The use of medication was considered justified by about one-third of the musicians in a sample composed by music students and faculty members (Wesner et al. 1990). Illicit drugs and alcohol were much less accepted with 7%. In a sample of professional orchestra musicians, almost all musicians who used occasionally beta-blockers reported success in reducing performance anxiety (Fishbein et al. 1988). To our knowledge, only two studies have yet investigated the need for more help and support to cope with MPA in professional conservatory music students (Kaspersen and Götestam 2002) and in adolescent high-school music students (Fehm and Schmidt 2006). Both studies showed that this need is considerable. Furthermore, no study has yet addressed music students' knowledge on the risks associated with substance-based coping strategies. We believe it is important to acquire information on the above-mentioned aspects relative to coping in order to better understand coping behavior and to initiate effective prevention.

Methods

Participants and procedure

In spring 2007, we contacted by mail all 870 music students (in the following referred to as students) in the classic section of the Swiss Music Universities of Freiburg, Geneva, Lausanne, and Neuchâtel. They were asked to participate in a questionnaire survey on the topic of stage fright. If necessary, they were reminded after 1 month to send back the questionnaire. The questionnaire was returned by 195 students, which represents a response rate of 22%. Students studying exclusively direction or teaching of theoretical aspects of music ($n = 5$) were excluded from the analyses, because neither playing an instrument or singing nor giving solo performances were a core element of their training. Of the 190 remaining students, 40% were male and 60% female. Participants' age ranged from 15 to 45 years, with an average of 24.2 years (SD = 4.1). Our sample was composed by 23 vocalists (12%), 37 brass players (20%), 16 woodwind players (8%), 59 string players (31%), 40 pianists (21%), and 15 miscellaneous (8%). Almost two-thirds (65%) played a second instrument.

Students' advancement in their professional music education at the music university ranged from the 1st year to the 7th year, with 76% in the first 3 years. The students indicated playing their principal instrument between 1 and 10 h per day ($M = 4.9$, SD = 1.8). The participants estimated the number of their solo performances during the past 12 months. Only four students indicated no solo performance. The others indicated from at least one up to more than 35 solo performances, most of them (74%) indicating between 1 and 10 solo performances. Approximately half of the students (47%) had already a professional music diploma, and 32% had followed an education other than a musical one. The study was performed according to the principles expressed in the 1964 Declaration of Helsinki and was approved by the local ethics committee, and all students gave their informed consent to participate.

Questionnaire

Based on the literature on MPA and on semi-structured interviews with university music students and teachers, we designed a questionnaire in French adapted for the goals of this study. Since there is no generally accepted measure of MPA, the construct was assessed in two complementary ways. The first measure assessed exclusively the affective dimension, i.e., the negative feelings of MPA. Therefore, we used the state scale of the Spielberger State-Trait Anxiety Inventory (Spielberger 1983). When referring to the state scale of the Spielberger State-Trait Anxiety Inventory, the term "STAI-S" will be used in the following for reasons of readability. The correct abbreviation is "STAI form Y-A". The STAI-S was chosen for several reasons. First, the affective dimension forms the central part of the experience of MPA in many musicians and is,

therefore, particularly important (Steptoe 2001). Second, almost all studies on MPA have used different questionnaires. Thus, there is no gold standard questionnaire to assess MPA. By contrast, the STAI—although somewhat unspecific—has been widely used in research on (performance) anxiety (Brodsky 1996; Kim 2005; Steptoe et al. 1995; Widmer et al. 1997). It consists of 20 items tapping apprehensive feelings of anxiety. Each item had to be rated on a 4-point scale (1 "not at all" to 4 "very much so"). The total score can vary between 20, indicating no anxiety at all, to 80, indicating extreme anxiety. This questionnaire was shown to have good psychometric properties (Spielberger 1983). In the present sample, the internal consistency estimated by Cronbach's alpha was 0.92. For the purpose of our study, we used the French version of the STAI-S (Schweitzer and Paulhan 1990). Since we wanted to assess how the students felt before the last public solo performances, we adapted the instructions to music performance situations and changed the verb tense from the present to the past as done in previous research (Kokotsaki and Davidson 2003; Steptoe et al. 1995; Widmer et al. 1997; Wolverton and Steptoe 1991). The second way to assess the construct of MPA was a global rating of the extent to which students considered stage fright as a problem, anchored by 0 "no problem" and 4 "major problem". This global rating was already used in previous research (Fishbein et al. 1988; Steptoe et al. 1995). Since MPA is not a familiar term and since the research at hand was realized on a French-speaking population, we used in the questionnaire exclusively the more common French word *trac*. This word describes specifically the feelings of tension and anxiety in a situation of a public performance and is familiar to every musician, like the term *stage fright* in English.

The other items of the questionnaire are listed in the overview hereafter:

- *Demographic data:* Gender and age;
- *Academic data:* 12 items concerning the different aspects of the musical training, instrument, exercise, and expertise;
- *Negative consequences of stage fright:* Eight items concerning the negative consequences of stage fright. Students were asked whether they had ever (a) failed an exam, (b) failed an audition, (c) received a bad critique, or (d) received bad marks because of stage fright. Furthermore, students were asked whether they had already (e) avoided performing in front of an audience or (f) interrupted or broken off a performance due to stage fright. Students also rated whether stage fright hindered them performing well. Finally, students were asked whether they thought that stage fright would hinder them attaining their professional goals.
- *Frequency of use and self-perceived effectiveness of coping strategies:* Eight items on the frequency of use of the following coping strategies in order to cope with stage fright: caffeine, nicotine, alcohol, illicit drugs, medication, natural substances (e.g., homeopathy), self-control techniques (e.g., relaxation, meditation, F.M. Alexander technique, and others), and breathing exercises. Furthermore, the self-perceived effectiveness of each used coping strategy was assessed;
- *Acceptance of substance-based coping strategies:* Three items asking about the acceptance of medication, alcohol, and illicit drug use to cope with stage fright or to increase the performance quality;
- *Knowledge concerning coping strategies:* Four items on whether the music students are informed about possible means to cope with stage fright and about possible side effects of medication, alcohol, and illicit drug use;
- *Need for more information on stage fright and more support to cope with it:* Five items to determine whether the music students wish to receive more information and support concerning stage fright and possible coping strategies.

The questionnaire further included questions on the physiological experience of MPA. This aspect is the subject of another paper (Studer et al. in press).

Data analysis

All analyses were performed using STATA/IC 10.0 for Windows (StataCorp 2007). First, since the response rate was low (22%), we carried out different analyses to determine whether the present sample is representative for university music students. Second, Pearson correlation was calculated to determine how closely the negative feelings of MPA and the experience of stage fright as a problem were associated. Third, simple ordered logistic regression analysis, used for the prediction of ordinal variables, was carried out to test whether students with higher STAI-S scores (a) used the different coping strategies more frequently and (b) accepted substance-based coping strategies better than students with lower STAI-S scores. The same statistical analyses were used to determine whether students experiencing stage fright as a problem (c) used coping strategies more frequently and (d) accepted substance-based coping strategies better than students not experiencing stage fright as a problem. To facilitate the understanding of significant regression results, non-parametric Spearman correlation coefficients are additionally reported. The frequency of use of coping strategies was analyzed separately for each coping strategy and also combined, by generating an overall mean frequency of use

of all assessed coping strategies. For these analyses, Bonferroni adjustment was performed to minimize the possibility to find a significant result spuriously by chance. Therefore, the usual alpha level of $p < 0.05$ was divided by the number of tests performed, i.e., 24. To be statistically significant, the p value had thus to be smaller than 0.002. Excluded from these analyses were students who indicated that they did not know whether stage fright was a problem for them ($n = 9$) and students who had more than 10% of missing values in the STAI-S ($n = 7$).

Results

Representativeness of the sample

First, the percentage of all contacted male students (44%) was not significantly different from the percentage of male respondents (40%) ($\chi^2(1, N = 1{,}065) = 1.17$; $p = 0.28$). Second, comparing the first year students of the present study sample ($n = 50$) to a representative sample of first year students of a Swiss German music university (response rate: 100%, $n = 62$; unpublished data), the difference in the gender distribution was not significant either (present sample 52% males vs. representative sample 66% males, $\chi^2(1, N = 112) = 2.3$, $p = 0.13$). Further, the first year students of the present sample and the representative sample did not differ significantly with respect to their STAI-S score ($M = 47.0$, SD = 11.0 vs. $M = 48.0$, SD = 11.7, $t(239) = 0.577$, $p = 0.44$) and the rating of stage fright as a problem ($M = 2.1$, SD = 1.0 vs. $M = 2.0$, SD = 1.1, $\chi^2(4, N = 112) = 2.1$, $p = 0.70$). The two samples of first year students differed significantly with respect to their age, with the representative sample being slightly younger ($M = 22.7$, SD = 2.9 vs. $M = 20.1$, SD = 2.5, $t(107) = 5.04$, $p < 0.001$). However, the actual age difference was small, and the participants can still be considered as young university music students. Therefore, we can reasonably assume that our sample was representative of all contacted students despite the low response rate.

Occurrence of stage fright

The STAI-S scores were normally distributed in the present sample and ranged from 25 to 75 with an average of 47.0 (SD = 11.0). Hence, almost the total range of possible scores was covered. The rating of stage fright as a problem was also normally distributed. Only 4% rated stage fright as being no problem (level 0). Levels 1, 2, and 3 were indicated by 25, 40, and 19% of the students, respectively, whereas 12% indicated that stage fright was a major problem (level 4). If levels 3 and 4 are summed together, about one-third of the students considered stage fright as a problem. There was a positive correlation of 0.45 between the STAI-S and the experience of stage fright as a problem ($p < 0.001$). Thus, the STAI-S explained 20% of the variance of the experience of stage fright as a problem.

Negative consequences of stage fright

Almost a quarter (22%) of the students declared that they had already failed an exam because of stage fright. Of the students concerned with auditions for an orchestra position, a chorus position, or an audition for a teaching position ($n = 101$), 35% indicated that they had already failed at least on one of these occasions because of stage fright. Bad marks in their exams and a bad critique due to stage fright were reported by 36 and 49%, respectively. A quarter of the students declared that they had already avoided public performance situations, and 11% declared that they had broken off or interrupted a public performance because of stage fright. Furthermore, 4% reported that stage fright impaired their performances very often, and 20% reported to feel impaired often. Sometimes, rarely, and never were indicated by 49, 22, and 5%, respectively. The majority of the students (62%) believed that stage fright would not hinder them to achieve their professional goals as a musician. However, a still considerable percentage of the students said that failing in achieving their professional goals due to stage fright would be possible (25%), probable (5%), or sure (2%), and 6% did not know.

Coping with stage fright

Table 1 presents the percentage of music students using different coping strategies. The percentages given hereafter refer to the students who have used the listed coping strategies at least exceptionally ("often", "sometimes", or "exceptionally") in order to cope with stage fright or to increase the performance quality.

Frequency of use of coping strategies: Breathing exercises, self-control techniques, and the use of natural substances were the most frequently mentioned coping strategies. Those who specified the used natural substances (69%) indicated homeopathy, Bach's flowers, and chocolate. The use of substances, which can potentially cause addiction, was reported much less frequently. Except for one student who gave no information, the used illicit drug was cannabis. A fifth of the students acknowledged having already used medication in order to cope with stage fright. The majority of them indicated beta-blockers (66%; $n = 23$) or gave no answer. Only few students mentioned tranquilizers ($n = 2$), paracetamol ($n = 1$), and others ($n = 1$). The percentages of students using medication, alcohol, and illicit drugs on a regular basis ("often" and

Table 1 Frequency of use of different coping strategies, sorted by decreasing frequency of "Often"

Coping strategies	Frequency of use				
	n	Often	Sometimes	Exceptionally	Never
Breathing exercises	184	39.1	22.8	9.3	28.8
Self-control techniques	186	27.4	19.4	11.8	41.4
Natural substances (e.g., Bach flowers)	184	12.0	15.7	16.3	56.0
Nicotine	188	6.4	3.2	2.1	88.3
Caffeine	188	4.8	7.5	17.0	70.7
Medication	186	3.8	5.9	9.1	81.2
Alcohol	188	0.5	1.1	7.4	91.0
Illicit drugs	188	0.0	0.5	2.7	96.8

Frequencies are in percent

n number of observations

Table 2 Self-perceived effectiveness of different coping strategies, sorted by decreasing frequency of "Very effective"

	Self-perceived effectiveness			
	n	Very effective	Moderately effective	Not effective
Breathing exercises	113	54.0	45.1	0.9
Medication	34	50.0	44.1	5.9
Self-control techniques	99	46.5	48.5	5.0
Illicit drugs	5	20.0	60.0	20.0
Nicotine	22	18.2	40.9	40.9
Natural substances (e.g., Bach flowers)	72	17.8	64.4	17.8
Alcohol	16	12.5	62.5	25.0
Caffeine	54	11.1	46.3	42.6

Frequencies are in percent

n number of students using the coping strategies at least exceptionally

"sometimes") were lower with 9.7, 1.6, and 0.5%, respectively. About two-thirds of the students who had already used medication to cope with stage fright indicated that the medication had been prescribed by a general practitioner. The remaining students had used medication without prescription. Considering exclusively those students taking prescription drugs, i.e., tranquilizers and beta-blockers, still 20% were taking them without medical prescription. Finally, 10% had already sought psychological support or had followed psychotherapy in order to cope with their stage fright, and another 10% did not answer this question.

The STAI-S score did not explain the frequency of use for any of the different coping strategies. There was a positive trend for the STAI-S in the explanation of the use of medication ($p = 0.08$). However, this trend disappeared after Bonferroni adjustment of the p values. The rating of stage fright as a problem did not explain the frequency of use for any of the coping strategies either, except for medication. The more students considered stage fright as a problem the more often they used medication in order to better cope with stage fright and to increase the quality of their performance (*regression coefficient* = 0.66; SE = 0.19; $p = 0.001$; *non-parametric Spearman correlation* = 0.26; $p < 0.001$). Furthermore, neither the STAI-S score nor the rating of stage fright as a problem predicted the frequency of use of the coping strategies when the latter were analyzed combined. A post hoc analysis showed that students who used medication more often were better informed on the possible risks of medication than those taking medication less often (*regression coefficient* = 0.43; SE = 0.17; $p = 0.01$; *non-parametric Spearman correlation* = 0.17; $p = 0.02$).

Self-perceived effectiveness of coping strategies: Table 2 shows the self-perceived effectiveness of different coping strategies. Breathing exercises, medication, and self-control techniques were the coping strategies that were rated as being very effective with the highest frequency compared to the remaining strategies. Each coping strategy had relatively high percentages of moderate perceived effectiveness, varying from 41 to 64%. Consequently, almost all students doing breathing exercises, using self-control techniques, or taking medication reported them to be at least moderately effective.

Acceptance of the use of medication, alcohol, and illicit drugs: Detailed percentages on the acceptance of medication, alcohol, and illicit drugs are given in Table 3. More than half of the students considered medication always or in certain cases a justified means to cope better with stage fright and to increase the quality of performance. The acceptance of alcohol and illicit drugs was considerably

Table 3 Students' acceptance of substance-based coping strategies, sorted by decreasing frequency of "Yes, always justified"

	n	Yes, always justified	Yes, justified in some cases	No, never justified	I do not know
Acceptance of medication	185	2.7	53.5	33.0	10.8
Acceptance of alcohol	188	0.5	12.8	75.5	11.2
Acceptance of illicit drugs	187	0.5	9.6	78.6	11.3

Frequencies are in percent

n number of observations

lower. The STAI-S score did not explain the acceptance of any coping strategy. There was a trend for the STAI-S in the explanation of the acceptance of medication ($p = 0.08$). However, this trend disappeared after Bonferroni adjustment of the p values. The rating of stage fright as a problem, on the other hand, was a significant predictor of the acceptance of medication use. With increasing ratings of stage fright as a problem, students showed a higher acceptance for medication (*regression coefficient* $= 0.62$; SE $= 0.17$; $p < 0.001$; *non-parametric Spearman correlation* $= 0.32$; $p < 0.001$).

Need for information and support concerning stage fright

Table 4 shows how well students felt informed concerning the possible risks associated with the use of illicit drugs, alcohol, and medication in order to better cope with stage fright or to increase the performance quality. Only a minority of the students indicated to be very well informed. A considerably higher percentage indicated to be not at all or only little informed. Considering exclusively those students who had already used medication ($n = 35$), alcohol ($n = 17$), or illicit drugs ($n = 6$) in order to better cope with stage fright, the percentages of not at all or only little informed students remained high with 47, 53, and 50%, respectively. Table 4 further shows the students' knowledge about coping strategies in general. More than half of the students said that they were not at all or only little informed about possible strategies to cope with stage fright.

Two-thirds of the students asked for more support in order to better cope with stage fright. The majority of these students (73%) would like to receive this support from specialists, such as psychologists, psychotherapists, or general practitioners, and more than half of them (56%) would like to receive more information from their professors. Support would also be appreciated coming from other music students and performing artists. More than half of the students (55%) indicated to be interested in receiving more information on the reasons of stage fright, 84% on strategies to better cope with stage fright, and 34% on the possible consequences of stage fright. Finally, almost all students (95%) thought that the topic of stage fright should be discussed more in their education at the music university.

Discussion

The present study is the first one investigating the extent to which stage fright is experienced as a problem in university music students. A considerable proportion of music students—one-third—experienced stage fright as a problem. Twelve percent of these students considered stage fright even as a severe problem. This result is consistent with previous research on professional musicians and student actors. Fishbein et al. (1988) showed in a large survey of 2,212 orchestral musicians that stage fright was a serious problem for 16% of the musicians. Steptoe et al. (1995) showed in a sample of student actors that stage fright was

Table 4 Students' knowledge on the risks associated with substance-based coping strategies and more generally, on possible means to cope with stage fright, sorted by decreasing frequency of "Very well"

How well are you informed…	*n*	Very well	Moderately	Little	Not at all	I do not know
…on the risks associated with illicit drug use	189	25.9	16.9	21.2	29.1	6.9
…on the risks associated with alcohol use	188	23.9	21.8	17.6	29.8	6.9
…on the risks associated with medication use	186	16.7	18.3	27.4	31.2	6.4
…on possible means to cope with stage fright	189	7.9	36.5	39.7	12.7	3.2

Frequencies are in percent

n number of observations

experienced as a severe problem by 10% of the actors. Furthermore, the present sample of music students had an almost identical level of negative feelings of performance anxiety as the sample of student actors reported by Steptoe et al. (1995) (STAI-S present sample: $M = 46.8$, SD = 10.8 vs. actor students sample: $M = 46.9$, SD = 9.8).

Interestingly, the correlation between negative feelings of MPA, assessed with the STAI-S, and the experience of stage fright as a problem was only moderate. The STAI-S explained only 20% of the variance of the experience of stage fright as a problem. A possible explanation for this finding is that the experience of stage fright as a problem cannot be resumed to the negative affective dimension of MPA. Musicians for whom stage fright represents a major problem can experience a wide range of anxiety levels, from low to extreme, and high levels of anxiety do not necessarily imply that stage fright is experienced as a problem. For future research, it would be interesting to investigate the association between other dimensions of MPA—i.e., cognitive, physiological, and behavioral—and the experience of stage fright as a problem. Dimensions of MPA influencing more directly the ability to perform, such as the physiological reaction to stress (e.g., breathing difficulties, tremor, sweaty hands), may more closely correlate with the experience of stage fright as a problem.

Many students have indicated that they had experienced a multitude of negative consequences due to stage fright: failing exams and auditions, receiving bad marks or critique, decrease of the quality of performance, avoidance of performance situations, and interruption of public performances. This is in agreement with previous findings in undergraduate and graduate music students and faculty members (Wesner et al. 1990). These debilitating effects of stage fright can have a negative influence on the career of musicians. This apprehension was expressed by 32% of the students regarding their professional goals as potentially endangered by the negative consequences of stage fright. However, it is important to bear in mind that these results are based on self-reports. While some students may attribute negative consequences to stage fright, they may have failed exams or auditions due to other factors such as ability, presentation, qualifications, musical style, and so forth.

Debilitating stage fright can drive musicians to turn to potentially harmful coping strategies. Nevertheless, regular use of illicit drugs and alcohol in order to cope with stage fright was rare in the present sample. Only one student took illicit drugs on a regular basis (sometimes, often), and only three students consumed alcohol to better cope with stage fright or to increase the quality of performance. These findings are in accordance with relatively low percentages of alcohol and illicit drug use in samples consisting exclusively or mainly of music students (Krawehl and Altenmüller 2000; Fehm and Schmidt 2006; Wesner et al. 1990). Steptoe (1989) reported with 22% a much higher percentage of alcohol use in professional orchestra musicians in the period before an important performance.

The regular use of medication in the present sample (10%) was higher than the use of illicit drugs and alcohol. Similarly, Steptoe (1989) found 12% of sedative consumers before an important performance in orchestra musicians. Abilgaard and Mathe (2003) reported that 4% of the music students used medication at least once a month, whereas the Fédération Internationale des Musiciens (FIM) survey (cited by Steptoe 2001) reported 20% of beta-blocker users over the past year in orchestra musicians. Fishbein et al. (1988) reported even 27% of beta-blocker users among professional orchestra musicians.

Taken together, these data suggest that the more advanced the musicians are in their career, the more the use of medication as coping strategies increases. This may be due to the experience of negative aspects linked to a musician's career, such as poor financial rewards, the competitive nature of the job, and uncertainty about employment. These factors are likely to increase the pressure on musicians to succeed as they advance in their career. Kenny (2004) states that it may not be surprising that some professional musicians prefer pharmacological solutions to better cope with MPA, because like most people, musicians want the quickest and easiest solution. The combination of these different factors may bring musicians to turn to potentially deleterious coping strategies.

It is important to bear in mind that the questions concerning the substance use have been asked in each study differently. Differences in percentages can thus be partially due to differences in the questioning methods. The percentage of medication use at university level in the present sample is sizable and disconcerting given the potentially deleterious side effects of medication use on health. Furthermore, the possibility of an underestimation of the real percentage of substance use for reasons of social desirability should be kept in mind. Natural substances, breathing exercises, and self-control techniques were used considerably more frequently than medication, illicit drugs, and alcohol. This finding is in line with many other studies (Abilgaard and Mathe 2003; Krawehl and Altenmüller 2000; Steptoe 1989). Contrary to our expectations, neither the performance anxiety level nor the experience of stage fright as a problem seems to influence the frequency of use of coping strategies in university music students, except for medication. Why does neither the level of performance anxiety nor its experience as a problem predict the frequency of use of the non-medicamentous coping strategies? First, performance-anxious students and those considering stage fright as a problem may lack knowledge on how to effectively cope with stage fright and, therefore,

do not use coping strategies more frequently than less performance-anxious students and those not considering stage fright as a problem. Second, some students may apply coping strategies with success and become thereby less anxious and consider stage fright less as a problem, whereas others are less successful in the use of the same coping strategy and therefore remain more anxious and consider stage fright more as a problem. However, due to the cross-sectional nature of the data, causal interpretations must remain tentative and need to be confirmed with a longitudinal research design.

But why is medication different? Possibly, substance-based strategies are chosen for their easy application or when other strategies are not known or not effective. Contrary to illicit drugs and alcohol, medication was the only substance-based strategy with a relatively high acceptance in the whole sample. Furthermore, the more stage fright was experienced as a problem, the more medication was considered as an acceptable means to better cope with stage fright and increase the quality of performance. Again, since the study has a cross-sectional design, we cannot determine whether the students accept medication because they use it or whether they use it because they accept it.

Breathing exercises and self-control techniques have been rated as effective with the highest frequencies together with medication. In the same line, Fishbein et al. (1988) found that beta-blockers were perceived to be effective by more than 96% of the surveyed musicians. The remaining strategies, i.e., caffeine, nicotine, alcohol, illicit drugs, and natural substances, were considered clearly less effective. Caffeine and nicotine were clearly rated as the least effective strategies. The fact that breathing exercises and self-control techniques have been subjectively rated as equally effective as medication is a promising finding and should be communicated explicitly to musicians suffering from stage fright in an attempt to decrease performance-related substance use. However, scientific data concerning the effectiveness of different treatments and coping strategies for MPA are still limited (for a review, see Kenny 2005).

The present study furthermore showed that there is a considerable need for more information and assistance to manage stage fright. Half of all the students acknowledged being not at all or only little informed about possible coping strategies and about the risks associated with the use of substance-based coping strategies. This percentage is astonishing and alarmingly high given the high rating of stage fright as a problem, the possible negative consequences of a bad management of stage fright, and its tendency to increase when entering the professional life.

Besides a considerable lack of information about stage fright and its management, the students demonstrated also a great eagerness and openness to learn more about coping strategies and stage fright. Two-thirds of the students were willing to accept support concerning stage fright, and almost the totality of the students was interested in including this topic further in classes. In the same line, Kaspersen and Götestam (2002) showed that 37% of full-time conservatory music students in Norway expressed not only the willingness to accept support but also a need for help to overcome performance anxiety. Fehm and Schmidt (2006) found 67% of the music students at high-school level calling for further help either during or outside the regular instrumental lessons. The same authors stated that already at high-school level, the students feel a lack of public performance opportunities and particularly a lack of communication on the topic of stage fright.

Being aware of these problems and needs, some music universities have started to integrate prevention courses on a voluntary or mandatory basis in their educational program. Courses such as "Prevention of Playing and Health Problems" or "Learning Strategies, Physiology & Mental Training" have proved to yield positive outcomes. The groups participating in these courses showed significantly larger decreases in the anxiety subscale of the Hospital Anxiety and Depression Scale than the control groups (Hildebrandt and Nübling 2006; Spahn et al. 2001). Further, Liebelt and Schröder (1999) have shown the effectiveness of prevention work concerning stage fright. Rosenfeld (2009) reported that music students benefit remarkably from her multidisciplinary approach for an active prevention of stage fright. She emphasizes the importance of breaking the taboo, creating an atmosphere of confidence and exchange, mental preparation and practice opportunities. Importantly, she characterizes education as a powerful instrument to reduce stress. There is evidence that professional instructions by teachers are helpful to better cope (Hildebrandt and Nübling 2004). A large university coping project is described in detail elsewhere (Hildebrandt 2009).

Finally, to better situate research on MPA, it is advisable to briefly mention research on other forms of performance anxieties in evaluative settings beyond the performing arts. An evaluation anxiety that has attracted much attention is public-speaking anxiety. However, research in this field is rarely comparable to performance situations that we are interested in the present study. This has several reasons. First, research on public-speaking anxiety is generally based on an impromptu speech paradigm. In these performance situations, participants have to talk about an assigned topic without having a particular interest for it. Furthermore, the participants have only a few minutes to prepare the speech and, thus, are poorly prepared. Finally, the performance outcome does not have any implication for them. The reality of musicians' performances differs substantially from the points mentioned above: musicians

often have a personal bond to the musical work; they are experts in their field; they are well prepared for the performance, and the quality of their performance is of major importance for their future career. These differences also apply to research using the Trier Social Stress Test to induce psychosocial stress, which is closely bound to a laboratory setting. Another performance setting often associated with evaluation anxiety is sport. Although both athletic and musical performances heavily rely on fine motor skills, athletes move around a lot, whereas musicians—especially classical musicians—must remain relatively calm. Thus, the two performance situations, probably including their preparation phases, are not comparable.

There are some noteworthy limitations in our study. First, the response rate was low with 22%. This response rate is comparable to other large studies using mail questionnaires as recruitment strategy (Lehrer et al. 1990; van Kemenade et al. 1995). However, to examine the representativity of our sample with all contacted music students, we addressed this issue in different ways. We showed that the gender distribution did not differ significantly between the contacted population and the sample. Furthermore, we did not find any significant differences between a full sample survey of a subgroup of university music students (unpublished data) and the corresponding subgroup in our sample, with respect to the gender distribution, the STAI-S score, and the rating of stage fright as a problem. Further, the distribution of the STAI-S was normal and covered almost the whole range of possible anxiety scores. The same holds for the experience of stage fright as a problem. Thus, students from very different performance anxiety levels were represented in the surveyed sample, and therefore, there was no bias in returning the questionnaire due to the level of performance anxiety or its experience as a problem. For all these reasons, we can reasonably assume that our sample was representative of all contacted students. Second, the retrospective assessment of MPA may be subject to cognitive distortions. However, since we were interested in the music students' usual MPA, the retrospective assessment was the most adapted method. Furthermore, the invitation to recall the most recent solo performances, and not just one, should have canceled out the influence of cognitive distortions at least partly. Third, the assessment of the experience of stage fright as a problem with a single-item might be perceived as a limitation. This may be a limitation in terms of reliability to assess the *objective* problem that stage fright causes in musicians. However, the rationale for the use of the single-item in the present study was to assess globally whether the students *subjectively* experience stage fright as a problem. The same approach was used previously in the same field of research (Fishbein et al. 1988; Steptoe et al. 1995). Fourth, potentially confounding psychological variables (trait anxiety, depression) were not assessed. Therefore, their effects on coping could not be controlled for. Fifth, the present study had a cross-sectional design. Hence, causal interpretations must remain tentative. Longitudinal studies are needed. Sixth, the university music students are a specific group of musicians at a particular moment of their professional education. Therefore, the results may not be generalized to more advanced musicians. However, knowledge on the students group is highly relevant for prevention and coping with stage fright because many of them will become professional musicians and must be able to deal with stage fright in order to succeed in their profession.

In conclusion, the experience of stage fright as a problem, the debilitating effects of stage fright on the musicians' ability to perform, the use of substance-based coping, and the experienced lack of information and support need to be prevented. These negative aspects of stage fright, which occur already at the beginning of a musician's career, may cause severe occupational problems. The openness of students to address the problem of stage fright in collaboration with experts, their professors, or other students contrasts with the often reported tabooization of the topic among professional musicians (Krawehl and Altenmüller 2000). Hence, the period of education in music universities seems to be a favorable point in time to inform and support students, to seriously address the problem of coping and substance abuse, and to foster prevention. This approach will hopefully contribute to the students' optimal preparation for their future professional career and the prevention of future occupational problems.

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